NCEP View on CFSv3

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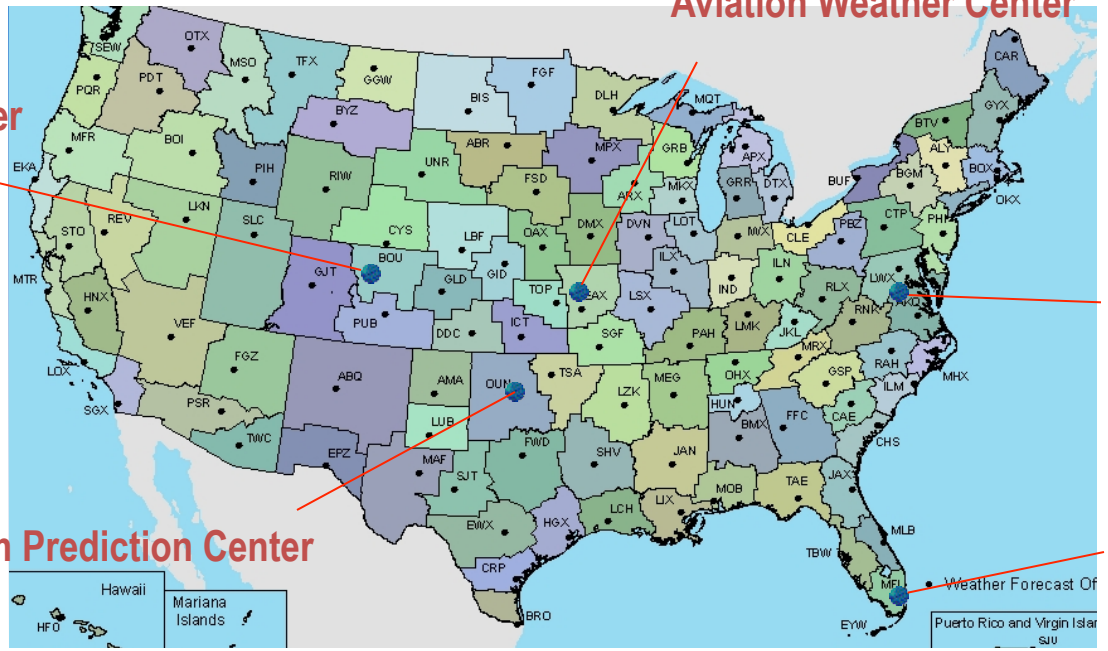
Outline

- NCEP overview
- Use of CFS Within Seamless Suite of Products
- Test Beds and the R2O Challenges
- NCEP requirement for CFS
- NCEP commitment for CFSv3
- Expectations for this meeting

NCEP Supports the NOAA Seamless Suite of Climate, Weather, and Ocean Products

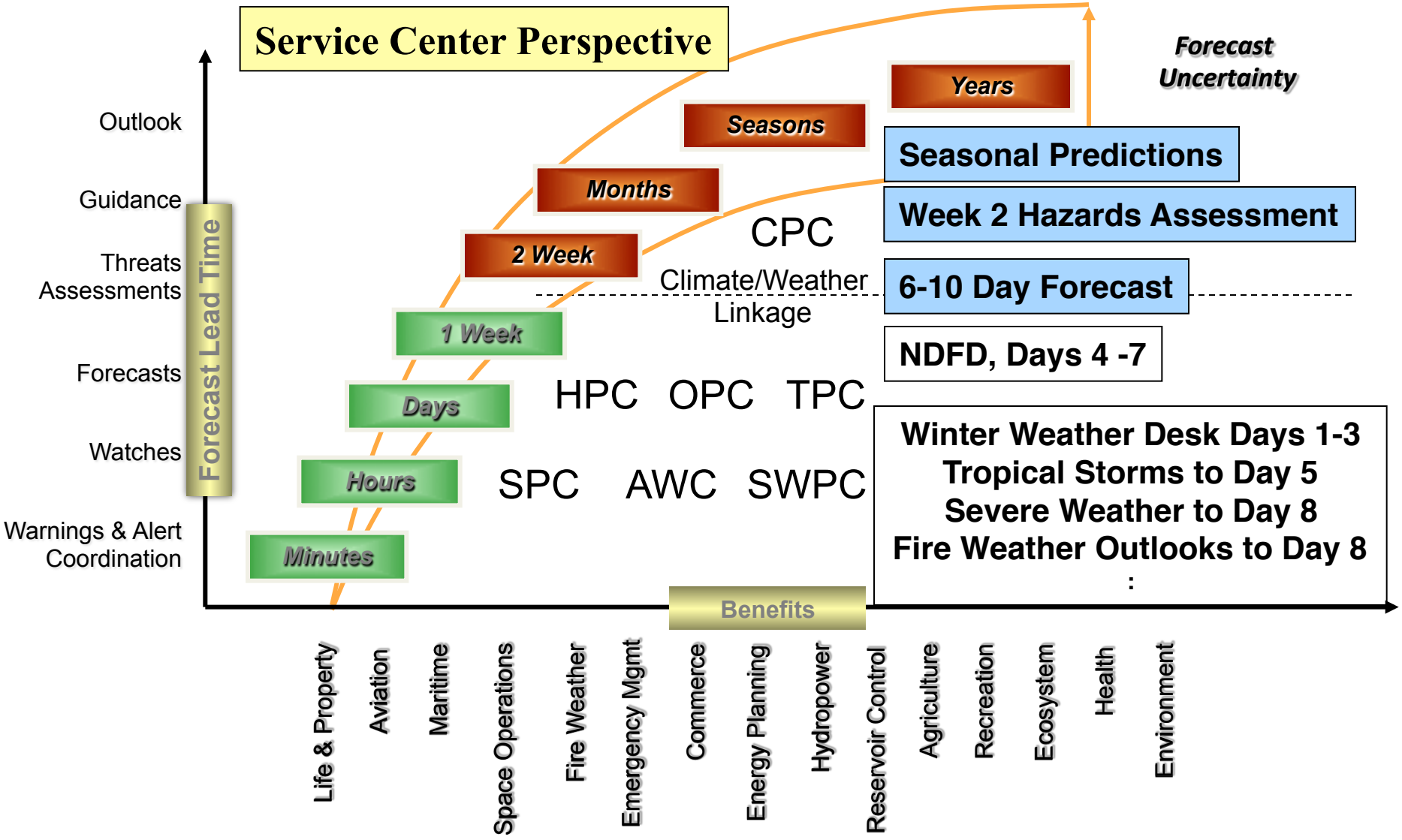
Organization: Central component of NOAA National Weather Service

Mission: NCEP delivers science-based environmental predictions to the nation and the global community. We collaborate with partners and customers to produce reliable, timely, and accurate analyses, guidance, forecasts, and warnings for the protection of life and property and the enhancement of the national economy.

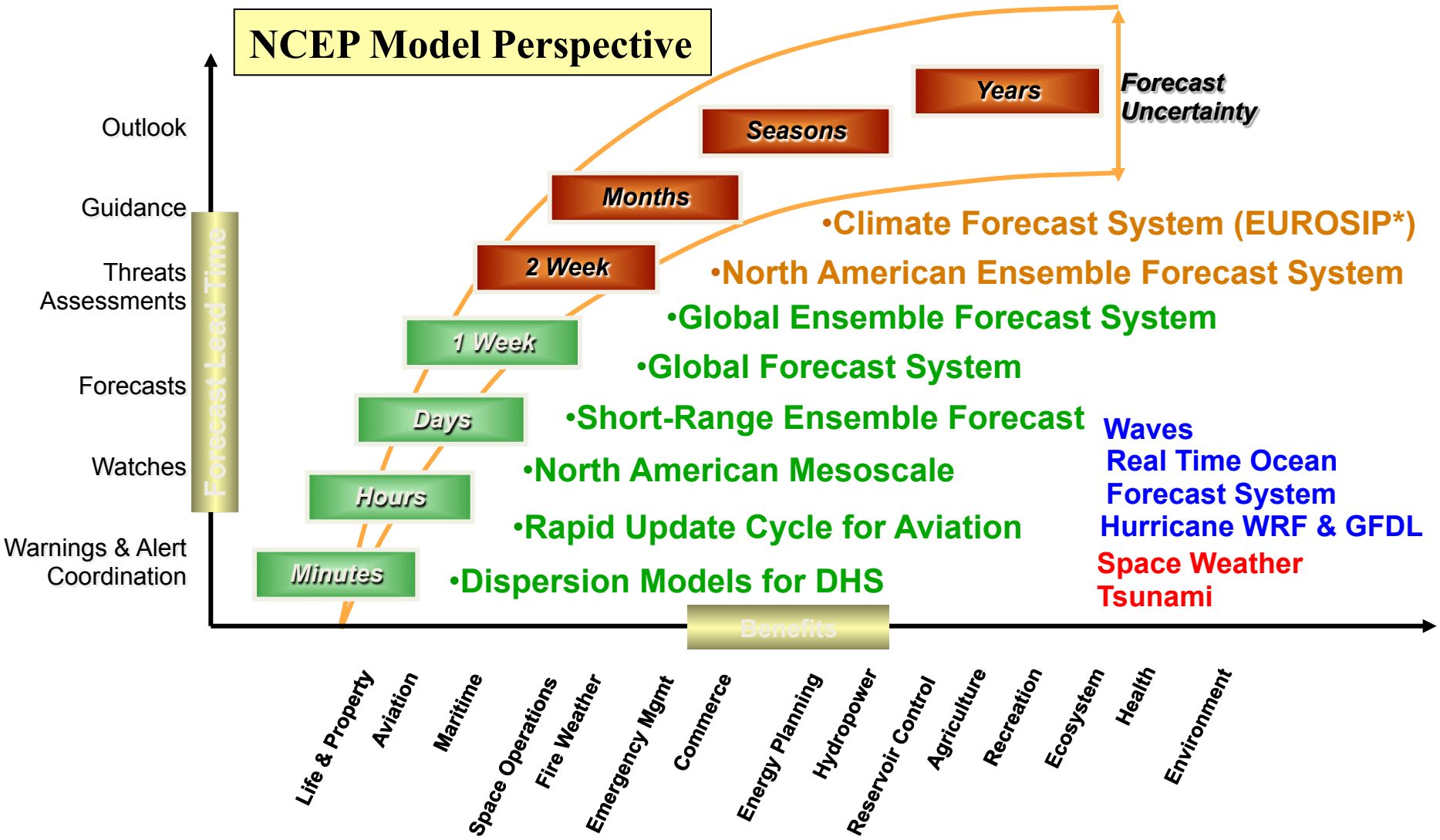


Vision: The Nation's trusted source, first alert, and preferred partner for environmental prediction services

NOAA Seamless Suite of Forecast Products Spanning Climate and Weather



NWS Seamless Suite of Forecast Products Spanning Weather and Climate



*To become available for NCEP operational seasonal prediction in Dec 2011

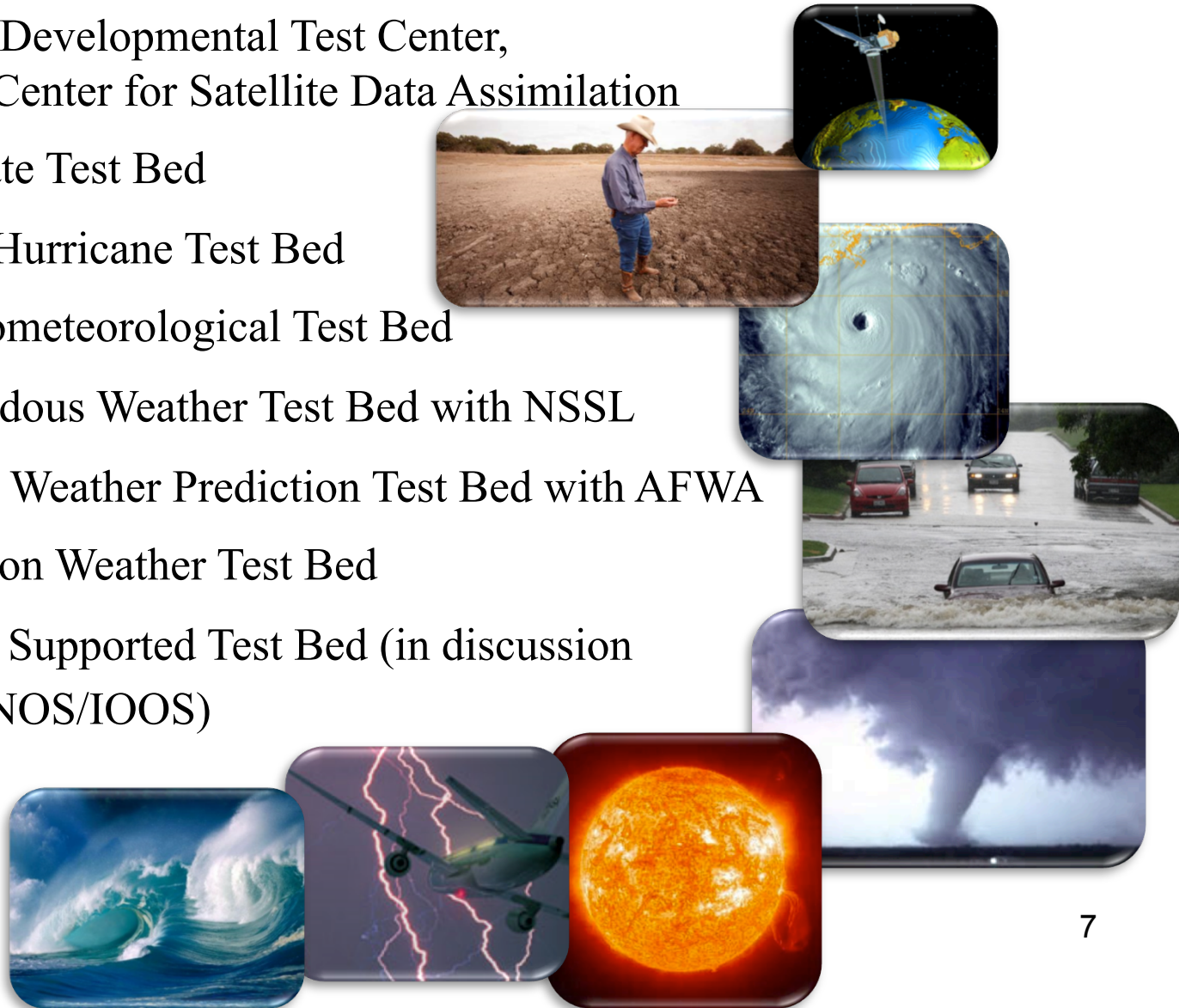
NOAA Climate Forecast System (CFS)

Attribute	CFS v1.0 Operational Since 2004	CFS v2.0 Operational Since March 2011
Analysis Resolution	200 km	27 km
Atmosphere model	2003: 200 km/64 levels Humidity based clouds	2010: 100 km/64 levels Variable CO2 AER SW & LW radiation Prognostic clouds & liquid water Retuned mountain blocking Convective gravity wave drag
Ocean model	MOM-3: 60N-65S 1/3 x 1 deg. Assim depth 750 m	MOM-4 fully global ¼ x ½ deg. Assim depth 4737 m
Land surface model (LSM) and assimilation	2-level OSU LSM No separate land data assim	4 level Noah model GLDAS driven by obs precip
Sea ice	Climatology	Daily analysis and 3-layer interactive sea ice model
Coupling	Daily	30 minutes
Data assimilation	Retrieved soundings, 1995 analysis, uncoupled background	Radiances assimilated, 2008 GSI, coupled background
Reforecasts	15/month seasonal output	24/month (seasonal) 124/month (week 3-6)

Test Beds

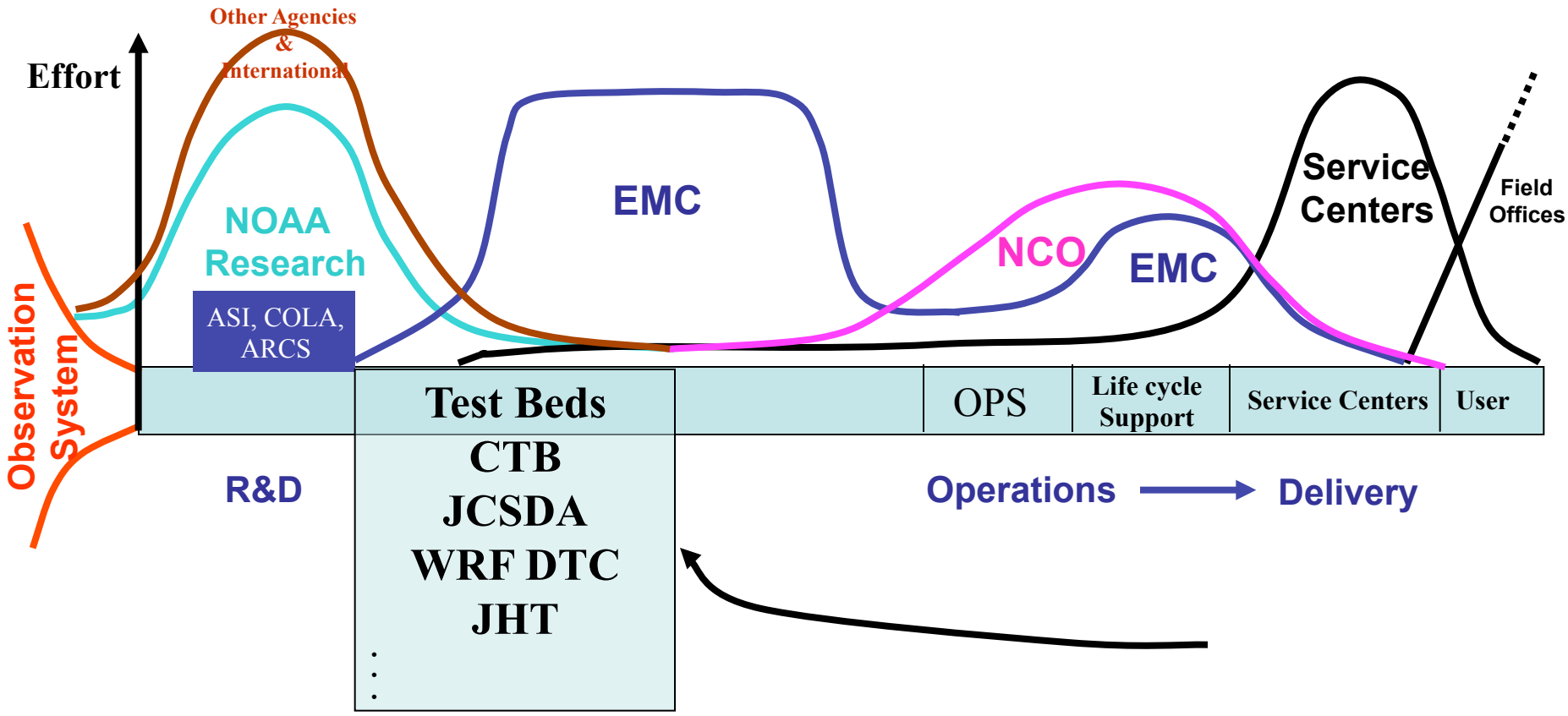
Service – Science Linkage with the Outside Community: Accelerating the R2O Transition Process

- EMC — WRF Developmental Test Center, Joint Center for Satellite Data Assimilation
- CPC — Climate Test Bed
- NHC — Joint Hurricane Test Bed
- HPC — Hydrometeorological Test Bed
- SPC — Hazardous Weather Test Bed with NSSL
- SWPC — Space Weather Prediction Test Bed with AFWA
- AWC — Aviation Weather Test Bed
- OPC — IOOS Supported Test Bed (in discussion with NOS/IOOS)



Schematics in the Model Transition Process

EMC and NCO have critical roles in the transition from NOAA R&D to operations



Operations to Research

Transition from Research to Operations

Launch List – Model Implementation Process

Concept of Operations

Requirements

Criteria

Forecast benefits, Efficiency, IT Compatibility, Sustainability

UCAR Review Recommendations for NCEP/EMC from the UCAR Review: Enhancing community engagement for the CFS

1) **Create a culture and work environment that attracts an extraordinary cadre of talented scientists**

2) Deploy computer capacity ….

3) Provide adequate human resources …

4) Employ data assimilation capabilities that are significantly advanced ..

5) **Embrace an entirely new approach to model development and implementation.** "It should be an effort that involves the entire national weather modeling community and engages partners from other agencies, academia, and the private sector"

NCEP is working to streamline the implementation process in accordance with this recommendation

My goal is to make these recommendations work for the CFS version 3.0

NCEP Requirement for CFS

- CFS is the dynamic model for NCEP **operational intra-seasonal and inter-annual forecasts**

- The CFS-based coupled Reanalysis provides the best estimate of the state of the coupled climate system, which are the basis for **operational climate monitoring and analyses**.

- The CFS-based reforecast provides basis for model calibration of CFS real time forecast used in CPC operations.

Commitment for CFSv3

- **NCEP Human Resources**
  - EMC:
    - Model implementation
    - Data assimilation
    - Reanalysis/reforecast
  - NCO
    - Model implementation
    - Sustaining the operational model suite
  - CPC:
    - Model diagnosis/evaluation
    - Applications for operational ISI forecasts
  - CTB:
    - Outreach to the research community
    - Providing a model testing environment for CFS evaluation, diagnosis and improvement
    - Supporting Climate Process Teams

- **NOAA Computer Resources**
  - GAEA – Site A
  - ZEUS – Site B
  - Operational WCOSS

Expectations

- Define NOAA's requirements for CFSv3 for climate prediction and climate modeling. Have to specify for total system
  - Reanalysis
  - Reforecasts
  - Model related archives

- Identify key areas to improve CFS
  - e.g., model infrastructure; Physics? Ocean? Coupling? …

- Role of CTB to enhance NCEP collaborations with external community for CFS development

- Identify range/role of CFS within MMEs (international and national): MME's representing a major "force for change" in the model and service provider communities

NCEP would like thank all participants for your engagement in CFSv3 planning process and future development/implementation.

NOAA Center for Weather and Climate Prediction

- Four-story, 268,762 square foot building in Riverdale, MD will house 800+ Federal employees, and contractors
  - 5 NCEP Centers (NCO, EMC, HPC, OPC, CPC)
  - NESDIS Center for Satellite Applications and Research (STAR)
  - NESDIS Satellite Analysis Branch (SAB)
  - OAR Air Resources Laboratory
- Includes 40 spaces for visiting scientists
- Includes 500 seat auditorium/ conference center, library, fitness center and health

History of Construction

- Groundbreaking March 2006
- Construction start May 2007
- Construction halted December 2008 - construction 80% complete
- In May 2009, the developer filed a claim in **Federal Court** to recover "damages" from the Government
- In June 2009, the developer filed for bankruptcy with the **County Court**
- The Federal Court dismissed all remaining claims filed by the developer on February 9, 2011
- These actions cleared away all remaining legal obstacles for the restart of work on the NCWCP project
- Work restarted April 6, 2011
- All activity on schedule

Move Schedule

- January 2012 – data center setup begins
- June – begin phased move-in
  - Front offices
  - Non-operational groups
- August 2012 – dual operations
- September 2012 – complete move
- October 2012 – ribbon-cutting ceremony

Appendix

NATIONAL CENTERS for ENVIRONMENTAL PREDICTION